



## Microbiota analysis to reveal temperature abuse of fresh pork

**Buschhardt, Tasia; Bahl, Martin Iain; Hansen, Tina Beck; Brejnrod, Asker Daniel; Abu Al-Soud, Waleed; Mortensen, Martin Steen; Sørensen, Søren Johannes; Aabo, Søren**

*Publication date:*  
2017

*Document Version*  
Peer reviewed version

[Link back to DTU Orbit](#)

*Citation (APA):*  
Buschhardt, T., Bahl, M. I., Hansen, T. B., Brejnrod, A. D., Abu Al-Soud, W., Mortensen, M. S., Sørensen, S. J., & Aabo, S. (2017). *Microbiota analysis to reveal temperature abuse of fresh pork*. Abstract from The Annual Congress of The Danish Microbiological Society (DMS), Copenhagen, Denmark.

---

### General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

## Microbiota analysis to reveal temperature abuse of fresh pork

Tasja Buschhardt<sup>a\*</sup>, Martin Iain Bahl<sup>a</sup>, Tina Beck Hansen<sup>a</sup>, Asker Daniel Brejnrod<sup>b</sup>, Waleed Abu Al-Soud<sup>b</sup>, Martin Steen Mortensen<sup>b</sup>, Søren Johannes Sørensen<sup>b</sup>, and Søren Aabo<sup>a</sup>

<sup>a</sup>Technical University of Denmark – National Food Institute, Kemitorvet Building 204, DK2800 Kgs. Lyngby, Denmark, <sup>b</sup>University of Copenhagen – Department of Biology, Section of Microbiology, Universitetsparken 15, DK-2100 København Ø

Violations of temperature regulations in the meat chain may affect meat safety. Methods are lacking to estimate whether meat has been subjected to temperature abuse. Exposure to too high temperatures may lead to systematic changes in the diverse bacterial communities of fresh meat. We investigated whether temperature induced changes in the community composition on fresh meat surfaces can reflect the temperature-history (combination of time and temperature). Sterile pieces of pork were inoculated with a carcass swab homogenate, to which *Salmonella* was added. Changes in the meat microbiota were monitored during aerobic chill-storage (4 °C and 7 °C) and temperature abuse (12 °C and 16 °C) for 96 hours, by culture-based methods and 16S rRNA gene sequencing. Bacterial genera that dominated during prolonged temperature abuse were *Acinetobacter*, *Serratia* and *Pseudomonas*, whereas chill-stored meat was dominated by *Pseudomonas* only. We also showed that the initial community affects subsequent changes during storage. The results suggest that principal coordinate analysis of beta diversity could be a useful tool to reveal temperature abused meat. Sequence data and culturing data revealed a strong positive association between growth of *Escherichia coli* and growth of *Salmonella*, which suggests that *Escherichia coli* can be used as indicator of temperature-history supporting growth of *Salmonella* on fresh pork surfaces.